The Linkage of Joint Operational Fires, Information Operations and the Army

Does the Army have effective feedback mechanisms that integrate operational fires (Physical Destruction) and Information Operations

A Monograph
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Abstract

Does the Army have effective feedback mechanisms that integrate operational fires (Physical Destruction) and Information Operations by MAJ Charles D. Mills, U.S. Army, 54 pages.

The information revolution seems to hold a lot of promise to the U.S. economy and the U.S. military, but rigid bureaucratic hierarchies make it extremely difficult for effective integration of operational fires and information operations (IO). As we observe the transformation of the U.S. military and other traditional institutions, they have been ill prepared to meet new organizational challenges posed by nonhierarchical, amorphous, and networked opponents due to adapting unevenly to the information revolution. This monograph serves only to suggest that the U.S. military has adapted to the information revolution unevenly due to constraints by institutional inertia, service rivalries, and conservative thinking.

Doctrine traditionally has emphasized centralized control of fires as the most efficient means of matching fires to capabilities, missions, and desired effects. In Objective Force (OF), due to the complexity and importance of integrating lethal and non-lethal fires and effects within IO, employing fires will require positioning delivery systems in a way that allows the ability to apply effects where needed. Additionally, as the concept of information warfare (IW) becomes more popular with certain circles of the U.S. defense establishment, it is imperative that the U.S. Army and the fires support community begin establishing effective feedback mechanisms at the operational level that effectively applies IO across all phases of an operation, throughout the range of military operations, and at every level of war.

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CHAPTER 1: INTRODUCTION

In today's fiercely competitive common operating environment, the U.S. Army and most other traditional institutions including firms and governments, are realizing that new initiatives such as technology, customer relationship management, and intelligence go hand-in-hand with a proven, organization-wide, multilevel application integration strategy. The goal of multilevel application integration is to integrate and streamline business and organizational processes across different applications. Additionally, the goals also include streamlining organizational units while allowing employees, decision makers, and organizational partners to readily have access to strategic and organizational data no matter where it resides. More and more, traditional U.S. Army organizations are faced with the challenge of integrating information and processes not only across those organizations, but also beyond service and coalition forces' organizational walls to encompass military-to-military integration.

Within the next few years, the Army may find itself involved in complex campaigns against major regional powers in stability operations within failed states dominated by competing paramilitary factions. As described within FM 6-02.40, the nature of future operations is best described by the following:

- Multidimensional. Existing throughout the height, width, and depth of the area of operations and electromagnetic spectrum.
- Precise. Taking full advantage of the capabilities inherent in digitized information systems; strategic, operational, and tactical sensors; simulations to execute operations with pinpoint accuracy.
- Noncontiguous. Encompassing a fluid concept of decisive, shaping and sustainment operations, which change as the factors of mission, enemy, terrain and weather, time troops available, and civilian considerations (METT-C) change.
- Distributed. Executing operations where or when required and achieving masterful effects at decisive points because of mission command, which empowers subordinates to operate independently within the commander's intent.
- Simultaneous. Conducting concurrent decentralized operations across the complete battlefield spectrum to achiever the mission objectives.

- Integrated. Army operations fully integrated with joint, interagency, multinational, and nongovernmental partners.[1]

The ability to operate effectively in the environment described above will require the U.S. Army to adapt itself more fully to a decentralized, nonhierarchical system—a system networked and flexible enough to command and control (C2) on the move and operate in this dynamic environment we call the information revolution.[2]

Doctrine traditionally has emphasized centralized control of fires as the most efficient means of matching fires to capabilities, missions, and desired effects. In the Objective Force (OF), due to the complexity and importance of integrating lethal and non-lethal fires and effects within information operations, employing fires will require positioning delivery systems in a way that allows the ability to apply effects where needed. Additionally, as the concept of "information warfare" (IW) becomes more popular within certain circles of the U.S. defense establishment, it is imperative that the U.S. Army and the fire support community begin establishing effective mechanisms at the operational level that effectively applies information operations (IO) across all phases of an operation, throughout the range of military operations, and at every level of war. The U.S. Army and the fire support community will come to realize that by applying concepts of the multilevel application integration strategy, integration problems at different operational flow levels—data flow, information flow, process flow, and service-to-coalition flow—could be solved. By flow we mean the delivery of meaningful information to subscribed systems and users in a smooth, continuous stream of information in real-time or near real-time as opposed to the bulk loading of large batches of data at selected intervals. Overall integration of operational fires and IO should be a controlled, conscious, well-formalized and elaborate process.[3]

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[1] Headquarters, Department of the Army, FM 6-02.40 Visual Information Operations, 24 January 2002, 1-1.

[2] Ibid., 1-3.

[3] Henry Mintzberg, *The Rise and Fall of Strategic Planning*, (New York: The Free Press, 1994), 42.

Defining the Problem

The information revolution seems to hold a lot of promise to the U.S. economy and the U.S. military, but rigid bureaucratic hierarchies make it extremely difficult for effective integration of operational fires and IO.[4] As we observe the transformation of the U.S. military and other traditional institutions, they have been ill prepared to meet new organizational challenges posed by nonhierarchical, amorphous, and networked opponents due to adapting unevenly to the information revolution. This is not to suggest that the U.S. government is neglecting to respond to these threats or to consider changes to organizational structures, because the U.S. government is probably farther ahead than any other government in understanding and responding to new threats.[5] This is only to suggest that the U.S. military has adapted to the information revolution unevenly. For example, the U.S. military has been successful in applying technology in the form of precision-guided munitions (PGM) to the battlefield and in tackling new roles and missions at the tactical level, but it has not addressed the disadvantages of such actions for its hierarchical and centralized system at the operational level when facing flexible, networked opponents in the new information environment.[6] Forty years ago, Morris Janowitz suggested in *The Professional Soldier* that technology had changed warfare to such a degree that coordination, cooperation, and teamwork are more fundamental to operational success than are authoritarian leadership and structure. As the U.S. military continues to experiment with new technologies that link soldiers and commanders in real time at the tactical level, the military's willingness to make needed organizational changes at the operational level are constrained by institutional inertia, service rivalries, and conservative thinking.[7]

[4] Thomas E. Copeland, *The Information Revolution and National Security* (Carlisle, PA: Strategic Studies Institute, August 2000), 6.
[5] Ibid., 6.
[6] Ibid., 6.
[7] Ibid., 7.

Framing the Approach to the Study (Rationalistic Mode)

The premise of this study is that planning is simply a superior form of management and formalized decision-making is better than nonformalized decision-making. [8] According to the school of philosophy known as rationalism, all knowledge can be obtained by strict adherence to the forms and rules of logic. The underlying assumptions of rationalism are as follows:

- The human mind can understand the world independent of its observable phenomena.
- Forms of knowledge exist that are independent of our personal experiences.

As a point of clarity, the rationalistic mode is concerned with knowledge that is true in principle as well as logically possible and permissible.[9]

The Research Question

This paper will address the question of whether there are effective feedback mechanisms at the operational level of IO that integrate the effects of operational fires (physical destruction) within the commander's intent for the IO campaign.

The Basic Assumptions of the Study

The rationalist approach is grounded on a set of basic assumptions, fundamental premises considered to be unproven and unprovable. These assumptions are necessary prerequisites for conducting the study required for this monograph. They may also assist us to understand better the effects of the traditionalist approach to learning organizations and support the claim that a flexible, adaptive, systems approach may be the preferred model for current IO doctrine.

- Nature is orderly: The most basic assumption of the scientific approach is that there is a recognizable regularity and order in the natural world; events do not just occur.
- We can know nature: This assumption expresses the basic conviction that human beings are just as much a part of nature as any other object, condition, or event. Put simply, the human mind is capable of knowing not only nature but also itself and the minds of others.

[8] Ibid., Mintzberg, 334.

[9] Chava Frankfort-Nachmias and David Nachmias, *Research Methods in the Social Sciences* (New York: Worth Publishers, 2000), 4.

- All natural phenomena have natural causes: This assumption acknowledges that once empirical regularities are discovered and established, they can serve as evidence for the existence of cause-and-effect relationships.
- Nothing is self-evident: Scientific knowledge is not self-evident; claims for truth must be demonstrated objectively. Because of this characteristic, scientific thinking is skeptical and critical.
- Knowledge is based on experience: If science is to help us understand the real world, it must be empirical; that is, it must rely on our perceptions, experience, and observations.
- Knowledge is superior to ignorance: Things that we did not know in the past we know now, and what we consider to knowledge today may be modified in the future. Truth in science is always dependent on the evidence, methods, and theories employed, and it is always open to review.[10]

The Aim of the Study

Having discussed the assumptions, the question raised earlier can now be addressed: How does Army fires integrate with Joint fires in building effective feedback mechanisms at the operational level that synchronize operational fires (physical destruction) and IO? The ultimate goal is to produce a cumulative body of verifiable knowledge that explains and predicts the evolving phenomena of information warfare and its effects on future strategy for Joint operational fires. Army and Joint capabilities provide a significant warfighting advantage to the Joint Force Commander (JFC). The Army brings the staying power of land forces with lethal and non-lethal fires and effects that contribute to the JFC's mission. The integration of fires and effects is critical to the success of Joint and coalition operations. Land-based operations require fires that are responsive and continuously available in all types of physical environments (terrain, weather, etc.). Army fires and effects must be integrated with Joint fires and other Joint force capabilities to enable the Joint force to achieve full spectrum dominance against any adversary, at any time, and under any conditions. This capability must be fully integrated with the emerging Joint functions of command and control (C2), battlespace awareness (BA), force application, protection, and focused logistics (FL) for Army and Joint operations.[11] The business community has been somewhat quicker than the military organizational adaptation for the information revolution. As a result,

[10] Ibid., 5-6.

[11] Headquarters, U.S. Army Training and Doctrine Command, *TRADOC Pamphlet 523-3-9: Objective Force Fires and Effects*, Washington D.C., 2003

companies have established unique organization models that enable them to coordinate strategic, operational, and tactical strategies that significantly enhance their successful adaptation to the changes in the global market.[12] There is much for the military to learn from the business community about flexible organizations, so it is for this purpose that this study can be used to improve the current Army doctrine governing offensive IO.

Chapter 2 will describe the conceptual foundations of IO, physical destruction and the relationships between theory and doctrine. This chapter will also focus on the fundamental elements such as concepts, definitions, the functions and structures of theories, models and relationships. Chapter 3 will focus on case studies that are oriented on military operations in Vietnam, Iraq, and Kosovo. The case studies will be used as a logical model of proof that guides and allows the researcher to draw inferences concerning the causal relationships that may be found in current IO doctrine. Chapter 4 will recommend critical attributes for building effective learning organizations that are able to adapt in the evolving information age by applying concepts from the multilevel application integration model (MFM).

Subordinate Questions

This paper will also answer a series of questions concerning the relationship between IO and operational fires. Does current Army IO doctrine integrate Joint IO doctrine that takes an interest in building effective feedback mechanisms at the operational level that synchronizes operational fires (physical destruction) and IO? Does current Army targeting doctrine focus on affecting adversary lines of communication (LOCs), logistics, command and control (C2), and related capabilities and activities while protecting similar friendly capabilities and activities? Is current Army targeting and IO strategies formulated in a controlled, formalized and elaborated process? Does the current Army culture build learning organizations that continually expand its capacity to nurture new, expansive, and collective

[12] Thomas E. Copeland, *The Information Revolution and National Security* (Carlisle, PA: Strategic Studies Institute, 2000), 7.

patterns of thinking toward the integration of targeting and IO? Is targeting and IO planning collaborative where actors are focused on a common (shared) understanding of the situation?

CHAPTER 2: MODELING THE CURRENT RELATIONSHIP BETWEEN PHYSICAL DESTRUCTION AT THE OPERATIONAL LEVEL AND THE OFFENSIVE INFORMATION OPERATIONS CAMPAIGN

Definition of Doctrinal Principles

IO involves actions taken to affect adversary information and information systems while defending one's own information and information systems. IO applies across all phases of an operation, throughout the range of military operations, and at every level of war. IW is IO conducted during time of crisis or conflict (including war) to achieve or promote specific objectives over a specific adversary or adversaries.[13]

There are two major subdivisions within IO: offensive IO and defensive IO. Offensive IO involve the integrated use of assigned and supporting capabilities and activities, mutually supported by intelligence, to affect adversary decision makers and achieve or promote specific objectives. These assigned and supporting capabilities and activities include, but are not limited to, operational security (OPSEC), military deception, psychological operations (PSYOP), electronic warfare (EW), physical attack/destruction, and special information operations (SIO).[14]

Offensive IO may be the main effort, a supporting effort, or a phase of a joint force commander's (JFC) campaign or operation. Offensive IO applies perception management actions such as PSYOP, OPSEC, and military deception, and may apply attack options such as EW and physical attack/destruction to produce a synergistic effect against the elements of an adversary's information systems.[15]

The Army defines IO as actions taken to affect adversary and influence others' decision making processes, information, and information systems, while protecting one's own information and information

[13] U.S. Department of Defense, Joint Publication 3-13: Joint Doctrine for Information Operations, 9 October 1998, I-1.

[14] Ibid., viii.

systems.[16] This definition differs slightly from the joint definition—actions taken to affect adversary information and information systems while defending one's own information and information systems.[17] The Army definition recognizes that individuals and groups in the information environment—especially the AO and area of interest—affect military operations. Threats and targets in the information environment include people who are not adversaries. These people are termed "others." The Army definition also identifies the decision-making processes of friendly, adversary, and other organizations as the focus of IO.[18]

Offensive information operations are the integrated use of assigned and supporting capabilities and activities, supported by intelligence, to affect enemy decision makers or to influence others to achieve or promote specific objectives. The Army definition deletes a sentence in the joint definition that lists IO elements associated with offensive IO. Army doctrine allows commanders to use all IO elements offensively.[19]

Current Doctrine Outlining IO at the Tactical Level of War

IO at the tactical level involves achieving specific tactical objectives. The primary focus of these IO is affecting adversary information and information systems relating to C2, intelligence, and other information-based processes directly relating to the conduct of military operations while protecting similar friendly capabilities.[20]

Current Doctrine Outlining IO at the Operational Level of War

IO at the operational level is conducted to achieve or support campaign or major operation objectives. The focus of IO at this level is on affecting adversary LOCs, logistics, C2, and related capabilities and

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[15] Ibid., II-1 - II-7.
[16] Headquarters, Department of the Army, *FM 3-0: Operations*, Washington, D.C., 2001, v.
[17] JP 3-13, I-1.
[18] Headquarters, Department of the Army, *FM 3-13: Information Operations (Final Draft)*, 7 October 2002, 1-13.
[19] FM 3-0, I-14.
[20] Joint Publication 3-13, I-13.

activities while protecting similar friendly capabilities and activities. Operational-level IO may contribute to strategic objectives by degrading an adversary's capability to organize, command, deploy, and sustain military forces and capabilities and by allowing the joint force to obtain and maintain the degree of information superiority required to quickly and decisively accomplish its mission.[21]

The Linkage of Information Operations and Physical Destruction Doctrine

Physical destruction is the application of combat power to destroy or degrade adversary forces, sources of information, C2 systems, and installations. It includes direct and indirect fires from ground, sea, and air forces. Also included are direct actions by special operations forces. The IOCOORD synchronizes execution of IO-related physical destruction with other IO elements. Physical destruction is tied to critical events and decision points in the adversary decision-making processes or their underlying infrastructures. Artillery is a major, but not the only, contributor to this IO element. The targeting team assigns IO targets to the air and ground systems best able to attack them.[22]

Information Operations Mechanisms as described by JP 3-13

A fully functional IO cell is paramount to successful IO. The JFC's staff, which includes the IO cell, develops and promulgates guidance/plans for IO that are passed to the components and supporting organizations and agencies for detailed mission planning and decentralized execution. The IO cell integrates the broad range of potential IO actions and activities that help contribute to the JFC's desired end state in an AOR or JOA.[23]

The organizational structure to plan and coordinate IO should be sufficiently flexible to accommodate a variety of planning and operational circumstances. The JFC should provide guidance for planning and conducting IO and assign responsibility for the employment of IO resources in joint operations. The JFC normally will assign responsibility for IO to a member of the joint staff, usually the Operations Officer (J-

[21] Ibid., I-3.
[22] *FM 3-13*, Appendix E.
[23] *JP 3-13*, IV-1.

3). When authorized, the J-3 will have primary staff responsibility for planning, coordinating, and integrating joint force IO (See Figure 1).[24] To assist the J-3 in exercising joint IO responsibilities, the J-3 normally will designate an IO officer. The primary function of the IO officer is to supervise the IO cell to ensure capabilities and activities are planned, coordinated, and integrated within the joint force staff and with higher echelon, adjacent, subordinate, and multinational staffs. The IO officer will ensure IO is implemented per the JFC's guidance.[25]

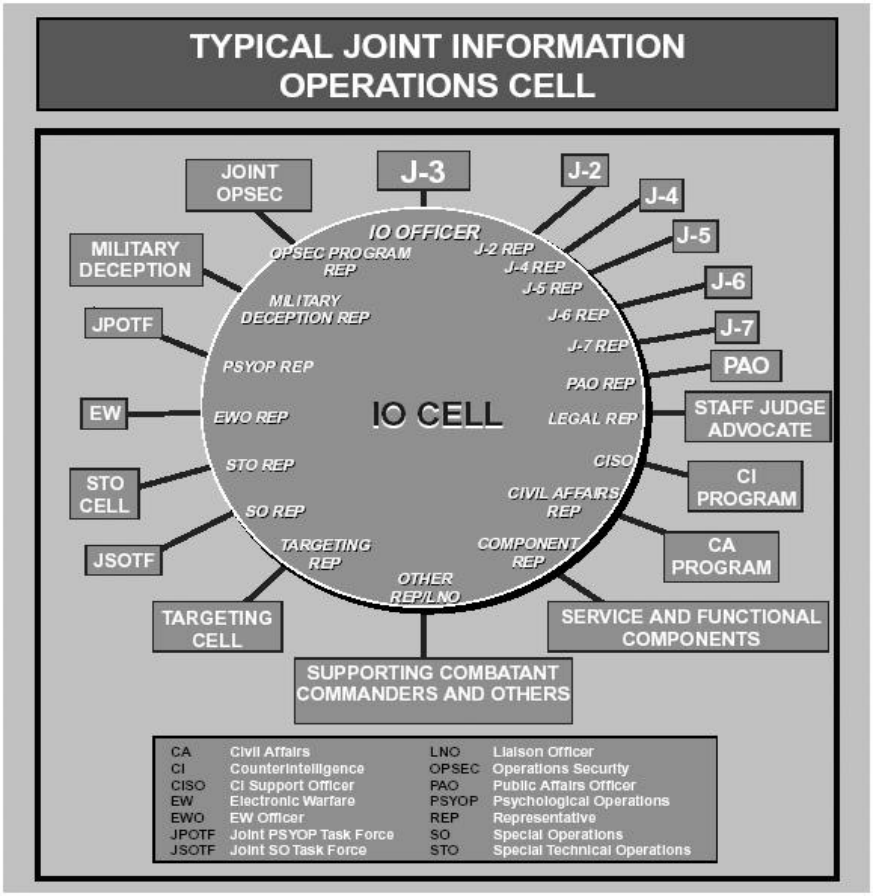

Figure 1 – Typical Joint Information Operations Cell

[24] Ibid., IV-1.
[25] Ibid., IV-3.

Information Operations Mechanisms as described by FM 3-13

The two targeting-related information operations coordinator (IOCOORD) products of mission analysis are a list of IO-related high value targets (HVT) and recommendations for the commander's IO targeting guidance. The IOCOORD works with the J2 during intelligence preparation of the battlefield (IPB) to develop IO-related HVTs. The IOCOORD works with the targeting team to develop IO targeting guidance recommendations.[26]

During course of action (COA) development, the staff prepares feasible COAs that integrate the effects of all elements of combat power to accomplish the mission. The IOCOORD prepares an IO concept of support for each COA based on the initial IO concept of support developed during receipt of mission. The IO objectives developed during mission analysis are refined as necessary to support each IO concept of support. The IOCOORD then identifies IO objectives and IO tasks required to achieve them for each COA. IO-related targets are developed and coordinated as IO tasks (See Figure 2).[27]

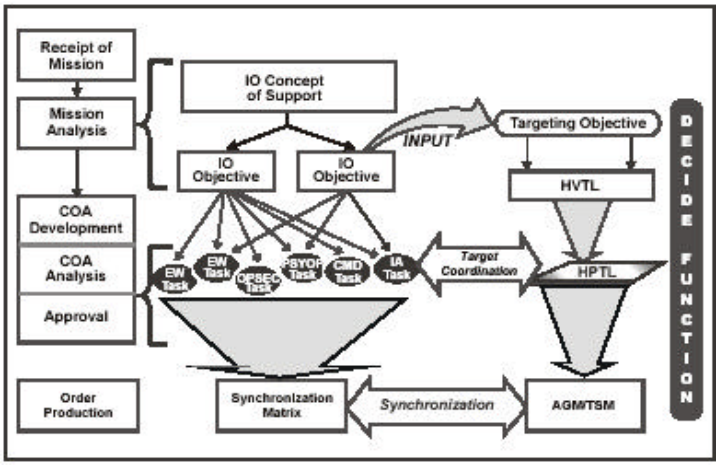

Figure 2 – IO Targeting Process

[26] *FM 3-13*, E-4.
[27] Ibid., E-5.

JP 3-60 and the Targeting Methodology at the Operational Level

As described in JP 3-60, the targeting process seeks to achieve effects in a systematic manner. The targeting cycle is a rational and iterative process that methodically analyzes, prioritizes, and assigns forces against adversary targets systematically to achieve the appropriate effects needed to meet the JFC's objectives. If the desired effects are not achieved, targets are recycled through the process. Additionally, JP 3-60 goes on to state that effective targeting is distinguished by the ability to identify the targeting options, both lethal and non-lethal, to achieve the desired effects that will support the commander's objectives. The success, to what has previously been described as effects-based targeting, is the ability to link sensors and delivery systems with the ability to rapidly collect, share, access, and manipulate information that is influenced through cumulative, cascading and collateral/additional natures of effects. The definition of the three natures of effects, as defined by the joint publication, is described below and will serve more useful purposes later.

1. Cumulative Nature of Effects: The effects that tend to compound, such that the ultimate result of a finite number of direct effects is greater than the sum of their immediate consequences.
2. Cascading Nature of Effects: The indirect effects that can ripple through an adversary target system, often influencing other target systems as well.
3. Collateral and Additional Nature of Effects: Effects that often spill over to create unintended consequences, usually in the form of injury or damage to persons or objects unrelated to the objectives. [28]

Reflecting upon the previous definitions of the nature of effects brings us to one important conclusion—without building effective feedback mechanisms within the targeting process that possess a continual process of intelligence analysis, the more it becomes a challenge to ensure that proper combat assessment measurements take place. The Air Force recently completed a two-year Capabilities Review and Risk Assessment study that identified and prioritized critical operational shortfalls. The most important shortfalls identified were the following: 1) Global information grid that collects, processes, stores, disseminates, and manages information for warfighters; 2) The need for battlespace management to provide and effects-based planning mechanism and a common operational picture; 3) A need to reduce

the time to find, fix, track, and target fleeting targets; 4) A need for a tool-kit to determine effects-based decisions on battle damage assessment across the battlespace (Air Force Press Release, #1217032).[29] Non-contiguous, nonlinear and distributed formations will require greater precision and coordination for sensor, delivery systems and munitions. Operations in urban areas, concerns about collateral damage, and high-payoff point targets will require precision delivery and in some circumstances, tactical nonlethal effects. Rapid force tailoring caused by enemy actions or changes in mission, call for flexible and easily tailorable organizations and a supporting battle command network.[30] As a result, the Army must seek to employ enhanced capabilities, new concepts and new organizational designs to enhance the contribution of fires.

Productive Feedback Mechanisms: The Roadmap to Successful Physical Destruction and Information Operations Integration

Systems Thinking: Cause and Effect Fundamentals

There appear to be many different ways of thinking "rationally," as described by Professor Derek K. Hitchins. Fundamentally, Professor Hitchins, former British Aerospace chairperson in Systems Science and Command and Control, boils them down to a few archetypes (See Figure 3).[31]

[28] U.S. Department of Defense, *JP 3-60: Joint Doctrine for Targeting*, 17 January 2002, I-5, 7.
[29] Air Force Press Release 1217032, 17 December 2003.
[30] Headquarters, U.S. Army Training and Doctrine Command, *TRADOC Pamphlet 525-3-9: Objective Force Fires and Effects*, 2003, paragraph 2-3-1.
[31] Derek Hitchens, "System Thinking," online document accessed 1 December 2003, available at http://www.hitchins.co.uk/SysThink.html

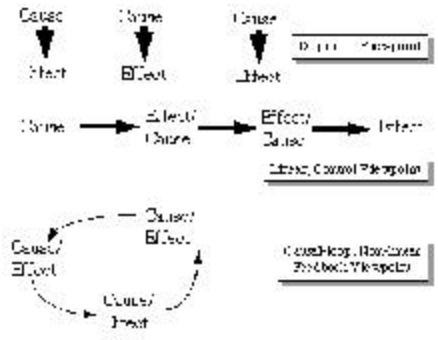

Figure 3 – Cause and Effect[32]

The explanation for Figure 3 follows:

1. The figure shows simple, straightforward reductionism thinking at the top. Effect follows upon cause. There is no observable connection between one cause and another.
    - Some politicians and accountants, often on ideological grounds, favor this mode of thinking, and they are unwilling or unable to accommodate the complication that would ensue if they followed the second archetype.
    - System thinkers in this domain use statistics and static models.
2. The second archetype indicates that "one person's effect is another's cause," i.e. that causes and effects form chains like dominoes falling.
    - This is a view held by many engineers and scientists, who believe in a clockwork universe and that, if only they had enough information, they could plot out the whole of time since creation and on into our futures.
    - System thinkers in this paradigm use Influence Diagrams and linear-difference equation models, which act as calculators in the sense of "what goes in can be logically traced to what comes out".
3. The third archetype views the world as made up of feedback loops, such that cause and effect chains loop back upon themselves.
    - This is the view held by cyberneticists and by advocates of non-linear dynamics and chaos.
    - This viewpoint proposes that the world is largely chaotic and that you can no more predict the future from the past than you can predict next month's weather from last month's.
    - System thinkers in this domain use Causal Loop Models (CLMs) and non-linear difference equation models. Often their models behave counter-intuitively, suggesting that the phenomenon they are thinking about may hold some surprises.

Progressing forward, attempts will be made to analyze how these approaches have influences within the case studies covered later; however, special emphasis on the third approach, the Causal-loop, Non-Linear

Feedback Viewpoint, will present it as the most important archetype presented by Professor Hitchins for military professionals to understand and adopt in the evolving age of IW.

Classical Organization Theory

Frederick Winslow Taylor and the Principles of Scientific Management

The development of Frederick W. Taylor's theory of scientific management marked the beginning of the managerial tradition in organization theory. Taylor's theory was designed to assist private-sector management in adapting production practices to the needs of an emerging industrial economy in the early 1900s. Taylor focused on private industry and prescribed a "science" of management that incorporated specific steps and procedures for implementation that emphasized formal structure and rules, dealt hardly at all with customers or with employee' working environment, and directly or indirectly equated the control needs of those at the top of the hierarchy with the needs of the organization as the whole.

The theory of scientific management rested on four underlying values: efficiency in production, rationality in work procedures, productivity in the workplace and profit (Gordon & Milakovich, 121). In addition to the values he outlined, Taylor also made several other critical assumptions to his theory. The assumptions he made are listed below.

- Taylor viewed organizational authority as highly centralized at top management levels. From midlevel managers and superiors, Taylor believed that at each level of the organization responsibility and authority were fixed at a central point.
- Taylor also believed that there was one best way to perform any particular task and through scientific research that method could be discovered and applied. [33]

A Blurred Principle: The Linear, Control Viewpoint

As with any scientific model or theory, there were shortcomings in the application of scientific management to industry and, later to government. A theoretical shortcoming that received considerable attention from later scholars was that, under scientific management, workers were seen as

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[32] Ibid.

mere cogs in the industry machine, with motives and incentives that were purely financial and with no other needs on or off the job that were worthy of incorporation into the theory.[34]

When the American industry tried to implement Taylor's theory, they ran into significant problems. Taylor had incorrectly assumed that management and labor would share the same objectives and that there would be no conflict over organizing to achieve them; thus, Taylor projected a united labor-management interest in his science of management. In the simplest terms, Taylor projected that demand for a product would always keep pace with supply and, thus, that maximum productivity would always be a goal of both management and workers. In practice (the reality of fog and friction) however, production levels sometimes came to exceed market demand for a product. When this occurred, management laid off some workers, retaining only the number needed on the job for each to maintain maximum productivity without causing total output to exceed demand. This touched off vigorous opposition (unanticipated feedback due to linear thinking) by workers who were "downsized" and by their labor unions.[35]

A Blurred Strategy: The Systems Model with Delay

Although Taylor also viewed management in rather one-dimensional, linear terms, critiques of his theory have concentrated on the consequences of viewing workers and the business environment too narrowly. For example, Al Dunlap, CEO of the Scott Paper Company in the early 1990s, was proud of his nickname--'Chainsaw Al'--and his turnaround at Scott. Profits and market value rose substantially on his watch. He did this by slashing the number of Scott employees and cutting such frills as research and development, but Dunlap rarely talked about Scott's steady loss of market share during his tenure.[36]

Dunlap's strategy might have looked feasible in the short term, but what Dunlap did not anticipate was by cutting the training budget to improve short-term profitability, in the long-term costs become apparent much further down the road. There are many examples in organizations and in life of actions

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[33] George J. Gordon and Michael E. Milakovich, *Public Administration in America* (New York: St. Martin's Press, 1998), 121.
[34] Ibid., 122.
[35] Ibid.

that produce short-term improvements but create much more serious long-term problems such as cutting the training budget to improve short-term profitability, drinking martinis to relieve stress, offering big rebates to get customers to buy now, or borrowing from a loan shark to pay back gambling debts. From these examples, a systems model might look like this [See Figure 4]. [37]

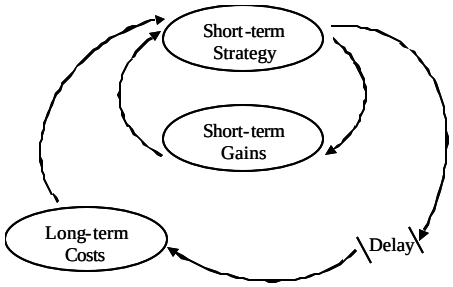

Figure 4 – Systems model with delay [38]

Systems Theory and Cause and Effect Fundamentals

Norbert Wiener Model: The Adaptive System

Norbert Wiener's classic model of an organization as an adaptive system, from his 1948 book *Cybernetics*, epitomizes basic theoretical perspectives of the systems perspective. Cybernetics, from a Greek word meaning "steersman," was used by Wiener to mean the multidisciplinary study of the structures and functions of control and information-processing systems in animals and machines. See Figure 5 below. [39]

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[36] Lee G. Bolman and Terrence E. Deal, *Reframing Organizations: Aritstry, Choice and Leadership* (San Francisco: Jossey-Bass Publishers, 1997), 26.
[37] Ibid., 27.
[38] Ibid.
[39] Jay M. Shafritz and J. Steven Ott, *Classics of Organization* Theory (Ft. Worth, TX: Harcourt College Publishers, 2001), 242.

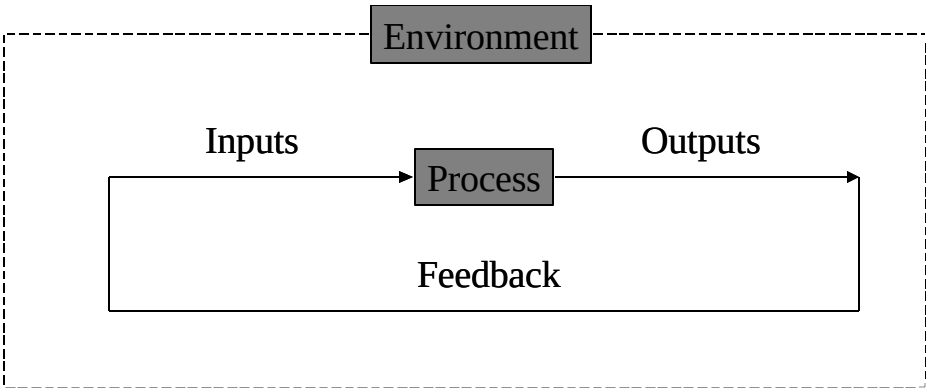

Figure 5 – Wiener's Model[40]

A system, as described by Wiener, is any organized collection of parts united by prescribed interaction and designed for the accomplishment of specific goals or general purposes. The basic concept behind Wiener's concept is self-regulation—through biological, social, or technological systems that can identify problems, do something about them, and receive feedback to adjust them automatically . Wiener, a mathematician, developed the concept of cybernetics while working on antiaircraft systems during World War II. Systems theorists have used variations of this model of a system extensively for many years, particularly around the development and use of management of information systems.[41]

Peter Senge: The Importance of Feedback Mechanisms

From systems dynamics in the 1950's to organizational development in the 1980s, a succession of management approaches has paved the way for current theorists such as Peter Senge. Senge creates his picture of the learning organization by combining ideas from theorists in the field of music, visioning, quantum physics, group dynamics, personal development and, most importantly, systems theory, where organizations are composite organisms affected by the actions of each member but capable of learning as a single unit. This system theorist sees organizations as always-changing processes of interactions among organizational and environmental elements. Senge believes that organizations are not static, but rather are in constantly shifting states of dynamic equilibrium due to feedback, a concept

[40] Ibid.
[41] Ibid., 242.

that he defines as actions that can reinforce or counteract (balance) each other. Organizations are adaptive systems that are integral parts of their environments and must adjust to changes in their environment if they are to survive. Theoretically, virtually all decisions and actions made within an organization affect their environment. In short, Senge views feedback as an assistant in simplifying life by helping us to see the deeper patterns lying behind the events and the details.[42]

An Adaptive Principle: The Causal-Loop, Non-Linear Feedback Viewpoint

The essence of the systems perspective lies in seeking interrelationships rather than linear cause-effect chains, and seeing processes of change and patterns of events rather than individual snapshots. It is holistic, seeing the whole as greater than the sum of its parts. Systems theory views an organization as a complex set of dynamically intertwined elements, including its inputs, processes, outputs, feedback loops (Causal-Loop, Non-Linear Feedback), and the environment in which it operates and with which it continuously interacts.[43] The interconnections tend to be complex, dynamic, and often unknown; thus, when management makes decisions involving the organizational element, unanticipated impacts (cumulative, cascading, or collateral/additional natures of effects) usually occur throughout the organizational system.

An Adaptive Strategy: The Multilevel Flow Model (MFM)

Functional Modeling (FM) is an approach that has been developed during the past 15 years. Of the different methods and applications built during these years, Multilevel Flow Modeling (MFM) is an application more applicable to the problem of integrating the targeting process and IO at the operational level. MFM is a method originally developed by Morten Lind, a retired professor of Control Engineering, Technical University of Denmark (Lind, pp. 1). The objective in MFM is to display all goals and functions of complex industrial systems on a multiple of interconnected levels, and by the simultaneous use of two decomposition principles called Means-Ends and Part-Whole. In MFM a system

[42] Peter Senge, The Fifth Discipline: The Art and Practice of the Learning Organization (New York: Doubleday, 1990), 73.

[43] Gordon and Milakovich, Public Administration in America, 242.

is represented by its goals, its functions (to attain the goals) and its components (to realize the functions). These three aspects of a system form the hierarchy of Means-Ends. Furthermore, a system is considered to be not only an entity, but also a compound, composed of many interacting parts, each of which can be described as a Means-Ends hierarchy. This is explained by the Part-Whole principle.

Mean-Ends and Part-Whole principles make it possible for a goal to be achieved by different sets of functions, and for a function to be realized by different sets of components. The component level in MFM can be decomposed into a behavior level (natural laws and causal relationships among variables), and a structural level (physical parts and their physical interconnections).

MFM incorporates a set of relation concepts to represent the relationships and the interconnections in a system. Connection relations interconnect the functions in every flow structure. Achievement relations describe the dependency of the goals to the existence of the functions, and the condition relations are used to explain the dependency of the functions to the existence of the goals, or to the existence of other functions. Achievement and condition relations are hence Means-Ends relations, since they interconnect the flow structures and the goals.[44]

Henry Mintzberg and Operationalization

The Importance of Organizational Planning

Organizational learning deals with a fundamental and universal problem of organizations: how to induce managers and other employees to act in the best interests of those who control ownership.[45] In the case of the U.S. military, government agencies, and non-governmental organizations, this refers to those who have the authority to control policy and resource allocation decisions. And given all the difficulties, especially with regard to the formation of information warfare strategies, planning beckons to future military planners to persist in carrying out planning on a formal basis. As described by Henry

[44] Morten Lind, "What Methods are Based on Functional Modeling?," article available online, accessed 1 December 2003, available from http://www.enre.umd.edu/ifmaa/fm04.htm.

[45] Bolman and Deal, *Reframing Organizations*, 32.

Mintzberg, his position was that effective organizations engage in formal planning, not to create strategies but to program the strategies they already have, that is, to elaborate and operationalize their consequences formally.[46]

The Cohesion of Organizational Programming and Planning

Operational planning flow models provide military planners with even greater control over process flow by providing effective tools for the prioritization and evaluation of various causal effects within and without the changing common operating environment. Targeteers and information operations coordinators can thoroughly test process flow models and rate the relative impact or importance of various changes and alternatives in the environment when they are properly staffed and resourced. Once the integration solution and resourcing is actually implemented, process flow also allow the targeting and information operations coordinators to monitor the process flow across the full spectrum of operations and respond rapidly should any problems occur. For this integration to be effective, it is an undeniable fact that through formalization, planning seeks to put some of that power into its own systems, specifically at the expense of managerial intuition. What this monograph also attempts to challenge is the assumption that planning is assumed to be the one best way to formulate and implement an information operations strategy. Planning should take over after strategy has been identified, so such that strategy creates the direction through synthesis while planning clarifies and orders that direction through analysis.[47]

The Tenets of Effective Organizational Programming

Information flow and feedback between the targeting cell and the information operations coordinator may be seen as the panacea for the effective application and integration of operational fires and IO. As the military common operation environment matures, this application may be the most difficult integration to obtain due to organization culture. This particular flow of information integration

[46] Mintzberg, The Rise and Fall of Strategic Planning, 333.

requires participation of all players within the information operations hierarchy, which has already been discussed earlier. Process integration encompasses a range of solutions that must work together to allow the information operations cell and decision makers to directly define, model, manage and change application processes in order to adapt to the current information environment. As the information revolution matures, essential characteristics of information operations planning must be comprehensive—that is, it covers all major elements of information operations—and that it is integrated into a balanced and synchronized program for the entire spectrum of operations.[48]

The Conditions of Organizational Programming

As stated earlier, Frederick Taylor and classical organizational theorists saw organizations as rational but closed systems that pursued the goal of economic efficiency. On the contrary, systems theory classifies most organizations as open systems. Systems theory also claims that the closed system approach may be realistic only at the technical level of organizational operations.[49] As a result, organizations at the operational level must adapt to uncertainty and create learning organizations designed to cope with the evolving information revolution. These organizations must allow other elements at the tactical level the opportunity to focus on the rational nature of technical operations.

Information Operations, Physical Destruction, MFM, and Mintzberg: Is There a Connection?

History and current doctrine provide a range of C2 organizational options for military organizations in the Information Age, but models for ideal command and control organizations in Information Age Warfare still remain a mystery and calls for further research and experimentation. Although ideal C2 options are still maturing, theories can be deduced from the previous discussions that the growing relationships between IO doctrine, targeting, and the environment of Information Age Warfare must be collaborative. Future IO C2 structures are hypothesized to be collaborative with decentralized C2

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[47] Ibid., 12, 342, 336.
[48] Ibid., 62.

dependent upon the complexity of the mission, cooperative with others (coalition, non-governmental actors, etc.), support information technologies, identify specialized functions such as logistics and time coordination, the quality of units, and the degree to which common doctrine, tactics, and procedures are available. (See Figure 6)[50]

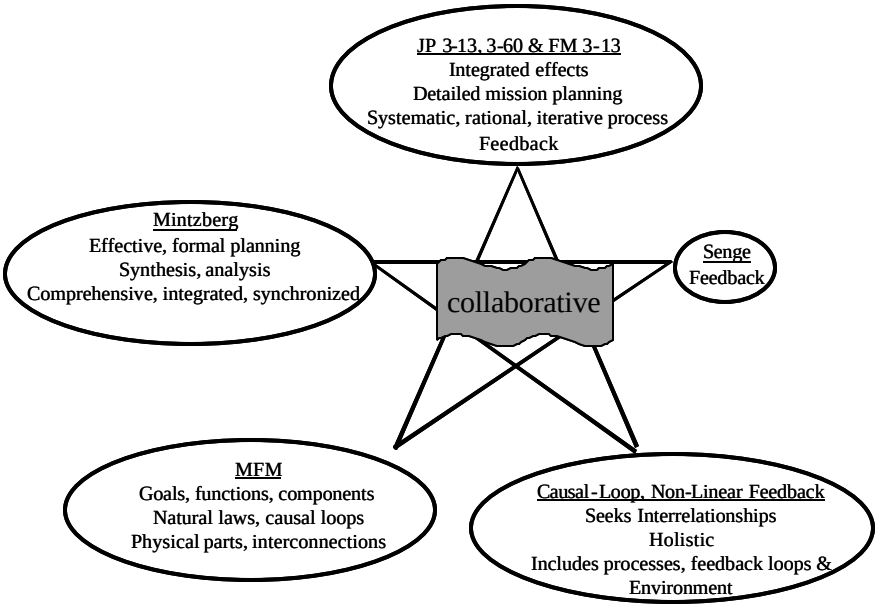

Figure 6 – Collaborative Model

Collaboration, then, requires active communication as part of working together. Collaborative planning is where actors with different functional and geographic areas of responsibility focus their attention on achieving assigned missions with a common goal. Their goals are to create a common (shared) understanding of the situation; take advantage of their differential knowledge, expertise, information, and capabilities; and organize the activities they control in time and space such that they will (a) avoid mutual interference and (b) have a synergistic effect.[51]

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[49] Shafritz and Ott, Classics of Organization Theory, 245.

[50] David S. Alberts et al., *Understanding Information Age Warfare*, Department of Defense Command and Control Research Program, August 2001, 180.

[51] Ibid., 186.

The Department of Defense Study, *Joint Vision 2020*, emphasizes that information superiority provides the joint force with a competitive advantage only when it is translated effectively into superior knowledge that then leads to superior decisions. Superior information converted to superior knowledge achieves "decision superiority"—decisions that are better and implemented faster than opponents can react. This decision superiority relies not only on information superiority, but also upon effective organizational and doctrinal changes, relevant training and experience, and proper command and control mechanisms.[52] In overlaying Lind's concepts of MFM with Wiener's model of an organization as an adaptive system (See Figure 7), criteria emerges that work toward a common purpose on how the Army achieves efficient and effective targeting that it requires in Information Age Warfare (IAW). Specifically, the Army must nurture a culture of adaptive learning, possess a controlled, formalized targeting effects strategy that synchronizes IO, and plan collaboratively to ensure a shared understanding of targeting and IO objectives.

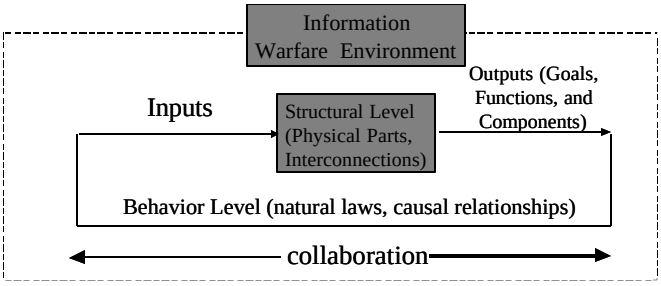

Figure 7 – Proposed IO Collaborative Model

[52] U.S. Department of Defense, *Joint Vision 2020*, online document accessed 27 June 2003, available from http://www.dtic.mil/jointvision.

CHAPTER 3: BUILDING LEARNING ORGANIZATIONS: A CASE STUDY OF U.S. OPERATIONAL FIRES AND INFORMATION OPERATIONS IN VIETNAM, IRAQ AND KOSOVO

Operational Fires, Information Operations and Vietnam

The American bombing of Vietnam is a classic example of conventional coercion. The United States conducted two major series of bombing campaigns against North Vietnam, Lyndon Johnson's ROLLING THUNDER from 1965 to 1968, which failed, and Richard Nixon's FREEDOM TRAIN and LINEBACKER campaigns in 1972, which succeeded in forcing concessions.[53] For the purposes of this monograph, we will go into the details of why ROLLING THUNDER's campaign failed during the Vietnam era.

The principal goals of the first major bombing campaign, ROLLING THUNDER, which ran from 2 March 1965 through 31 October 1968, were to coerce the North Vietnamese into halting the infiltration of men and supplies into South Vietnam and entering into peace negotiations. In fact, careful studies show that there was a broad consensus among administration officials about the goals of ROLLING THUNDER: it was meant to dissuade the North from infiltrating men and supplies into the South and to force Hanoi to negotiate a peace settlement. Although some officials, particularly McGeorge Bundy, United States Information Agency (USIA), believed that the air campaign would also bolster South Vietnamese morale and reaffirm the credibility of the American commitment to revisit revolutionary activity in the Third World.[54] Of course, the major assumption that the administration was making rested solely in part on the ability of the United States to conduct a successful coercive campaign.

[53] Robert A. Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, NY: Cornell University Press, 1996), 174.
[54] Ibid., 175-177.

The emerging strategic concept for future war is nearly identical to the concept of "graduated pressure" that Secretary of Defense Robert McNamara and his principal subordinates developed during the Vietnam War. This concept of graduated pressure was derived from Thomas Schelling's book *Arms and Influence*. Schelling's logic of manipulating the risk of punishment for political purposes was embedded in his theory that bombing must be gradually escalated in intensity, geographically extent, or both in order to influence the population.[55] McNamara, in adopting Schelling's theory, believed that fundamental changes in the nature of war made traditional military advice based on the need to impose one's will on the enemy irrelevant and even dangerous to national security. Similar to aspects of "effects based operations" McNamara developed a strategy that would use military force not to destroy, but to signal resolve and intentions to the enemy. The metrics that McNamara used were systematically focused on bombing against carefully-selected targets and small commando raids that were designed to effect Vietnamese Communist "calculation of interests" and convince them to desist from their support for the insurgency in South Vietnam.[56]

Basically, a strategy of attrition offered the Army the prospect of winning the war quickly, or at least more quickly than with traditional counterinsurgency operations, which promised to be long and drawn out. General William C. Westmoreland, Commander, U.S. Military Assistance Command Vietnam (COMUSMACV), argued that given the geographical limitations involved, there was no alternative to attrition. He claimed that "it was not enough merely to contain the big units. They had to be pounded with artillery and bombs and eventually brought to battle on the ground if they were not forever to remain a threat." On 14 November 1965 elements of the 1st Cavalry encountered regimental-size formations of North Vietnamese in the Ia Drang Valley, with the Communists suffering over 1,200 killed while the U.S. losses exceeded 200. To Westmoreland and the MACV Staff, the Ia Drang Valley Campaign represented the successful application of the attrition strategy. Leveraging the use of two major air weapons—

[55] Thomas C. Schelling, *Arms and Influence* (New Haven, CT: Yale University Press, 1966), 2-6,99-125.
[56] H.R. McMaster, "Crack in the Foundation: Defense Transformation and the Underlying Assumption of Dominant Knowledge in War," U.S. Army War College Center for Strategic Leadership Volume S03-03, November 2003.

helicopters and fighter bombers—provided essential mobility and firepower to the South Vietnamese and to the U.S. forces. But despite the victory in the battle of the Ia Drang, Westmoreland quickly realized that his attrition strategy would take time and additional troops to reach what he called the crossover point, the point where the enemy's losses in battle would exceed his capability to replace them. The most imposing means of fire support available to the Army at the time was the B-52 bomber raids, and as early as 14 May 1965, COMUSMACV had recommended that the aircraft be made available. That year, 1,320 sorties were flown against targets in South Vietnam.[57]

Thus, massive firepower was the primary means utilized by the Army to achieve the desired end of the attrition strategy—a body count. The Army's preoccupation with reaching the crossover point eventually made the body counts the enemy of traditional counterinsurgency doctrine.[58] By giving top priority to the body count, the Army adopted the body count as the criterion for measuring success in Vietnam and used firepower and technology in order to support its theory.

Critical Analysis

Disjointed, Linear Control, or Causal-Loop, Non-Linear Feedback Viewpoint

With further analysis, we find that the situation in Vietnam was too complex a problem for bombing to solve, and that the linear thinking of McNamara, his advisors and Westmoreland kept them from recognizing that the future course of events depended not only on U.S. action but also on enemy reactions and initiatives that were difficult to predict.[59] To understand why the Schelling strategy was ineffective during the ROLLING THUNDER campaign, we must first consider how Hanoi perceived the territorial interests it had at stake and the extent to which the Schelling strategy raised the risks of civilian damage. At stake in ROLLING THUNDER was the status of South Vietnam. North and South Vietnam had been separate only since 1954, and until the Tet offensive in 1968, the insurgents were mostly South

[57] Andrew F. Krepinevich, Jr., *The Army and Vietnam* (Baltimore, MD: The Johns Hopkins University Press, 1986), 166-169, 200.
[58] Ibid., 202.
[59] McMaster, Crack in the Foundation, 59.

Vietnamese. North Vietnam viewed the south as part of its homeland, so Hanoi's commitment to its territorial interests was based on the powerful motive of national cohesion. In light of the importance Hanoi attached to South Vietnam, the lenient Schelling strategy did not create risks of sufficient magnitude to affect the North's political calculus.[60]

The principal problem was that the threat of limited conventional bombing of industrial targets did not pose the risk of especially brutal civilian hardship. The industrial sector of North Vietnam's economy was not a highly valued asset and produced only 12 percent of a gross national product of $16 billion in 1965.[61] North Vietnam's industrial base was apparently a legacy from the French, but further development of these facilities for the future had not been strategically planned within governmental resourcing which had stunted industrial progress by domestic standards.

ROLLING THUNDER did not pose high risks to the civilian economy as a whole due to the fact that Hanoi waged an ardent propaganda campaign against the United States, claiming that U.S. bombing had damaged civilian sectors of the economy. For example, North Vietnam's dike system was the backbone of North Vietnam's agricultural economy, and the destruction of dikes through U.S. targeting could flood rice paddies and threaten a basic staple of the civilian diet and increase the danger to civilians as well. In an incredible propaganda campaign, Hanoi claimed in the fall of 1967 that that the U.S. bombing campaign destroyed twenty-four dikes, but U.S. intelligence determined that only four had been partially damaged by accident, with no evidence of flooding.

Most important, the risks to population centers were low, Hanoi's propaganda again notwithstanding.[62] The ROLLING THUNDER campaign's physical pattern indicated no real intention to kill large numbers of civilians, but to use air interdiction aimed at choking off the logistical flow of the North Vietnamese guerrillas. Unfortunately, however, the use of massed firepower as a crutch in lieu of an innovative counterinsurgency strategy alienated the population and provided the enemy with an

[60] Pape, *Bombing to Win*, 189.
[61] Ibid., 189-190.

excellent source of propaganda. Thus, while the Army killed many Viet Cong (VC), it never denied the enemy his source of strength—access to the people. Fundamental flaws in the Vietnam War strategy of graduated response and attrition by McNamara, his principal assistants and Westmoreland were oblivious to the human and psychological dimensions of war. From the U.S. perspective bombing and limited raids might have appeared as coercion and communication short of war.[63] McNamara and the architects of graduated pressure greatly underestimated the resolve of the North Vietnamese leadership and the ability of Vietnamese communist forces to suffer losses and continue fighting. As a result of waging this kind of war, the Army missed the opportunity to apply its formidable resources in areas that would have produced long-term results by gaining support for the government and denying the VC badly needed manpower and supplies.[64]

Meeting the MFM Criteria: A Final Analysis

By the mid-1960s, the American military culture was corrupted by the dominating personality of McNamara and his approach to national security policy. McNamara's expertise as a number cruncher had pushed him to the presidency of Ford Motor Company, and brought the current methods of American business, a cost accounting mentality and a rigid engineering view of the world, to the business of managing the Defense Department. Because of the influence of McNamara and those he brought with him to the Department of Defense (DoD), a common theme developed in American defense policymaking that saw American technology, statistical and quantitative measures of efficiency, and the coming of the computer age as rendering factors such as history, culture, and the traditional understanding of war irrelevant.[65]

As a result, the military planned and addressed strategic and operational questions in terms of quantitative and technological measures such as the number of weapons captured, villages pacified,

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[62] Ibid., 190.
[63] McMaster, Crack in the Foundation, 59.
[64] Krepinevich, *The Army in Vietnam* , 197.
[65] Murray Williamson, "Clausewitz Out, Computer In: Military Culture and Technological Hubris," *The National Interest* 48, Summer 1997, 3.

enemies killed, ton miles of cargo flown, and bombs dropped.[66] Nothing else was considered or mattered to the military due to the fact that they pushed history and the ambiguities of the battlefield into a set of technological and game-theoretical assumptions.[67] Thus, Americans marched into Vietnam with no knowledge of the language, culture, traditions, and history of the people on whose behalf the United States was intervening, and, what was worse, neither the civilian leadership at the Pentagon nor the professional military even sought such knowledge (a major aspect of a learning organization—the desire to learn).

As a result, the culture of the time committed the Army to fighting without the benefit of a unified military effort, much less the centralized direction of all military political, law enforcement, economic, social, and intelligent activities necessary for successful counterinsurgency operations.[68] Thus, while the Army killed many VC, it never denied the enemy his source of strength—access to the people. The result was a seemingly perpetual rejuvenation of the insurgent forces (feedback) as seen below in the systems with delay model.

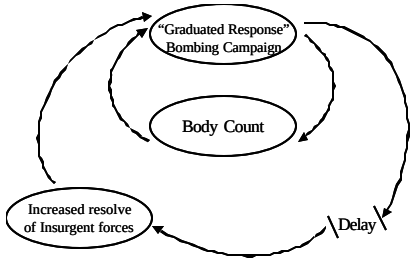

Figure 8 – Vietnam Systems Model with Delay

Operational Fires, Information Operations and Iraq

OPERATION DESERT STORM (ODS) was a far less "precise" war than many believed in the immediate aftermath of victory. American forces encountered significant difficulties and experienced a high degree of uncertainty. The key question, in reference to ODS, is not whether or not air power has

[66] Krepinevich, *The Army in Vietnam* , 165-168.

become so powerful that it can decide international disputes, not simply without costly ground campaigns but even without deployment of any credible ground threat.[69] The air forces were unable to target the Iraqi nuclear program due to a lack of intelligence. Air crews fought through inadequate intelligence, equipment malfunctions, and poor weather.[70] The effects of air power were impressive by succeeding in coercing Iraq to withdraw from Kuwait, but it did so by undermining its ability to defend against the Coalition's ground threat.[71]

Additionally, the ODS is also important as the first major use of strategic bombing to decapitate an opponent's leadership in order to achieve victory by changing or paralyzing the enemy government. Unlike prior strategic bombing campaigns, which tried to inflict enough pain on enemy civilians to overwhelm their interests in the dispute or to attack national armaments industries in order to reduce the enemy's overall military resources, decapitation focuses on political and military leaders and national communications networks. ODS was fought on the foundation of two strategies—the decapitation campaign, which pursued victory solely through strategic bombing of a small number of political and economic targets in the hope of isolating Saddam Hussein's regime from its political and military control structures, and the denial campaign, which aimed more at annihilating the Iraqi army than at coercion through denial.[72]

The decapitation campaign, known as INSTANT THUNDER, aimed to win with a six-day strategic air campaign alone, which would decapitate the Saddam Hussein regime, rendering it unable to govern Iraq or control military forces.[73] It was so named to distinguish it from the graduated and failed ROLLING THUNDER campaign during the Vietnam War. INSTANT THUNDER was a combination of two campaigns, a decapitation and a denial, but the decapitation campaign was originally planned to come

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[67] Murray, "Clausewitz Out," 3.
[68] Krepinevich, *Army in Vietnam*, 165.
[69] Pape, *Bombing to Win*, 211.
[70] McMaster, Crack in the Foundation, 11.
[71] Pape, *Bombing to Win*, 211.
[72] Ibid., 211-212.
[73] Ibid., 220.

first under the guidance and leadership of General H. Norman Schwarzkopf, Central Command (CENTCOM) Commander in Chief (CINC). Under the decapitation campaign, Phase I would be the "strategic air campaign," which would achieve air superiority over Iraq and cripple its political and military leadership. Phase II would be a "Kuwait air campaign" to gain air superiority over Kuwait and allow "unchallenged use of the skies for fixed wing and [helicopter] operations." Phase III would be "ground combat power attrition" to "reduce Iraqi ground force capability, soften ground forces to assure successful penetration and exploitation, reduce ability to lay down chemicals, and destroy Republican Guard capability to reinforce Kuwait." By 20 December 1990, plans called for executing Phases I, II, and III simultaneously, with Phase I lasting six days, Phase II two days, and Phase III fourteen days, followed by an eighteen-day ground campaign.[74]

INSTANT THUNDER sought to kill, overthrow, or isolate Saddam Hussein and his regime, or to use the threat of these events to compel Saddam to withdraw from Kuwait. An early August 1990 planning document on INSTANT THUNDER focused more on overthrowing and isolating the regime, listing its goals, "to induce: A. Saddam Hussein to withdraw all Iraqi forces completely from Kuwait and restore the legitimate Kuwaiti government; B. create conditions conducive to the overthrow of the Saddam Hussein regime by patriotic Iraqi elements who may be more amenable to withdrawal from Kuwait; C. render Iraq incapable of providing strategic and operational support to its forces in Kuwait and significantly reduce Iraq's offensive and defensive potential for a prolonged period."[75]

To accomplish these objectives, INSTANT THUNDER planned to attack eighty-four targets in six days, attacking the main target sets simultaneously. First, air power would gain command of the air, destroying the Iraqi air force, long-range missiles, and weapons of mass destruction. The object was not only to render Iraq defenseless to stop subsequent attacks but also to signal Saddam's weakness to the population. Second, the coalition would attack the regime with precision munitions, striking key leadership facilities (presidential residences and VIP bunkers), telecommunication nodes (telephone

[74] Ibid., 220.

exchanges and television and radio stations), and internal security organs (Ba'ath party and secret police headquarters, and government ministries). Finally, air power would hit economic infrastructure (electric power, oil facilities, railroads, and bridges) in order to harass and frustrate the Iraqi public, "to convince the Iraqi populace that a bright economic and political future would result from the replacement of the Saddam Hussein regime.[76]

Critical Analysis

Disjointed, Linear Control, or Causal-Loop, Non-Linear Feedback Viewpoint

When the evidence from ODS became accessible, studies revealed that the technological superiority explanation for overwhelming victory was simplistic. Dr. Stephen Biddle, one of the first analysts to gain access to detailed data on the ground war, concluded that it was a combination of Iraqi errors, American technological superiority, and a dramatic skill imbalance between Iraqi and coalition forces that produced powerful, "nonlinear" linear results.[77] Once again, the military leadership applied and sometimes misapplied the latest management techniques such as Total Quality Management (TQM) to improve operations. TQM is a management system developed in private industry and based on statistical process control (SPC) techniques aimed at satisfying customer expectations by continuously working across the organization to improve internal and external processes.[78] While business principles focus on maximum payoff for minimum investment, war seeks to overwhelm the enemy such that he is unable to take effective action. While business relies on projections to gauge demand, control production, and manage supply chains, the human and psychological dimensions of war often make projecting such demands impossible to make with any degree of specificity. As a result, problems arise when managerial practices

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[75] Ibid., 222.
[76] Ibid., 222-223.
[77] McMaster, Crack in the Foundation, 11.
[78] Gordon and Milakovich, *Public Administration*, 374.

and business principles influence military strategy, operations, or organization without sensitivity to the unique features and demands of war.[79]

INSTANT THUNDER failed to kill, overthrow, or isolate Saddam or his regime. It posed no significant threat to Iraq's senior political and military leadership. None of Iraq's top political or military leaders were killed during ODS. In fact, all of the top forty-three Iraqi political and military leaders on 15 January 1991 were still alive after 1 March. Nor is there any evidence that relatives of Revolutionary Command Council members were killed, although it is possible that some family members of second-ranking officials may have died in the Al-Firdos bunker. Indeed, it was apparent that American forces encountered significant difficulties and experienced a high degree of uncertainty during ODS due to the fact that INSTANT THUNDER posed no significant threat to the Iraqi leadership. The one known effort to kill a senior Iraqi military leader by matching a real-time intelligence to air attack (the Iraqi Corps commander on 26 January) failed not because bombs were late but because the commander did not show up.[80] Iraqi leadership took extreme measures to disguise their whereabouts to avoid assassination attempts by domestic and regional foes, and as a result, confusion and incomplete information characterized the frustration of planning ground operations at the Corp level and below.

INSTANT THUNDER also failed to overthrow Saddam's regime, by either coup or popular revolt. Specifically, targeting leadership facilities and communications networks between the leadership and the instruments of state power could weaken Saddam's control, while attacks on economic infrastructure brought the war home to the general population and encouraged the formulation of counter elites. Consequently, in order to support an effective coup, planning must evaluate the regime by criteria that share elements of a successful coup. The literature on successful coups suggests that they share three elements. First, conspirators must be able to plan in advance without being detected. Second, the vast majority of state officials and population must not have a strong interest in opposing the new ruling elite. Third, poverty is a common denominator among coups. One recent study of 121 countries between 1950

[79] McMaster, Crack in the Foundation, 52.

and 1982 found that the poorest were twenty-one times more likely to have coups than the wealthiest states and that a high rate of economic growth dramatically inhibits coups. [81]

Using the previous criteria, Saddam's regime was a poor target for coup makers. First, in 1968, Iraq adopted one-party totalitarianism. Just as Cuba, North Korea, Outer Mongolia, and Vietnam have not experienced any successful coups since adopting a Marxist-Leninist form of government, so Iraq's vulnerability to coups dramatically lessened when it built a large state apparatus that supports the political domination of the Ba'ath party. An extensive network of secret police numbering more than 250,000 permits the Ba'ath party to monitor Iraq's 18 million people closely, and the Republican Guard and other division-sized units repress opponents. Further, the Ba'ath party has emasculated its main threat, the military, by removing military officers from political office, ending factionalism within the officer corps, and establishing lines of authority parallel to the command hierarchy that are directly responsible to the regime. As a result, totalitarianism in Iraq reduces the prospects for a coup both by making conspiracies more difficult and by increasing the requirements for success. Conspiracies are more difficult because the cooperation necessary for opposition within elite circles is severely discouraged by the high incentives individuals have to defect.[82]

Furthermore, the regime established concentric circles of support within Iraq's social structure. The largest circle contains Iraq's million Sunni Arabs, who have dominated the upper economic, political, and military classes for centuries and whose support for Saddam rests on the fear of Shi'a fundamentalist rule and Khurdish separatism. The next is the Ba'ath party, membership in which has become a fact of life for Iraq's nearly 1 million state employees, creating political and economic ties to the current regime. Lastly, Iraq had those who were formally associated with state power, including "full members" of the Ba'ath party, the core leadership group, and key individuals who control state organizations generally related to Saddam by blood or marriage. Concentric loyalty reduces the regime's vulnerability to a coup by tightly

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[80] Pape, *Bombing to Win*, 230.
[81] Ibid., 232-233.
[82] Ibid., 233-234.

linking devotion to Saddam with access to Saddam, reducing the odds that those he meets with would support his removal.[83]

Secondly, the Ba'ath party stressed modernization and more equal distribution of wealth by egalitarian distribution of income and services, by creating a socialist economy, and by rapid economic development. Between 1968 and 1983, the Ba'ath regime redistributed land, developed a welfare state funded by oil in which education and health services are free, and rapidly developed heavy industry and manufacturing—all of which improved social mobility for the lower and middle classes. The improvement of economic well-being for the Iraqi population reduced the risk of coup because it removed a major source of grievance among would be plotters: poor economic performance by the regime. [84]

Thirdly, INSTANT THUNDER did not solve the most important execution problem of potential coup makers: knowing Saddam's location at a specific time. Although INSTANT THUNDER destroyed a handful of locations Saddam could use, mobile communication systems permitted him to remain in contact by radio or messenger wherever he was. Although destroying communications among these forces would slow their response to rebel forces beyond their positions, they were already located in the most important strategic areas for any coup forces to control. Accordingly, the imbalance of force favoring Saddam was so great that it overwhelmed any effects of slow communication between the forces. In short, INSTANT THUNDER assumed that Saddam's regime rested on its physical ability to provide secure leadership areas and telecommunications to support forces that were vulnerable to air attack. In fact, it rested on a political structure that air attack could not alter.[85]

INSTANT THUNDER also failed to isolate Saddam's regime from the battle in Kuwait, despite official statements to the contrary. The air war degraded communication between Baghdad and the KTO significantly, but not enough to cripple Saddam's ability to direct theater wide operations. Although the civil telecommunications system through which 60 percent of military landline communications passed

[83] Ibid., 234-235.
[84] Ibid., 235.

appears to have been destroyed in the first days of the air war, air power did not destroy a dispersed network of command posts between Baghdad and Kuwait wit high-frequency radio transmission capability, and it did not stop couriers. Specifically, by 23 February the Joint Chiefs of Staff battlefield damage assessment for the president indicated that 75 percent of national command telecommunications and 30 percent of military communications were still "operational." Moreover, numerous prisoner of war reports affirmed that communications from Baghdad to Kuwait were continuously available. Despite claims that the Iraqis were incapable of communicating with or reposition forces, in response to the enveloping attack by coalition forces Iraq was able to order a withdrawal from the theater and to direct five Republican Guard divisions to screen the retreat by blocking a breakthrough by the Seventh Corps into the Iraqi rear. [86]

Meeting the MFM Criteria: A Final Analysis

ODS represented the culmination of a culture of military leadership that embraced a Clausewitzian culture after returning from the wreckage of Vietnam. Unlike McNamara with his rigid engineering view of the world, Clausewitz provided officers an intellectual statement for their deepest belief that war was inherently unpredictable, uncertain, and ambiguous at every level. Though the emerging military culture appreciated the centrality of the human factor of war, due to the influence of the information age, they would fall prey to the theory that technology could enable U.S. military forces in the future to lift the fog of war. In essence, this new theory represents a return to the McNamara paradigm—a belief that American technological superiority will allow U.S. forces to achieve quick, easy victories over their opponents with relatively few casualties.[87]

The belief that industrial age warfare had been supplanted by yet-to-be-defined information age warfare gained wide acceptance. Adherents to the technological superiority explanation for overwhelming victory in the Gulf not only advocated the aggressive pursuit of new technologies such as

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[85] Ibid., 236.
[86] Ibid., 239-240.
[87] Murray, "Clausewitz Out, Computer In," 5-6.

sensors and precision weapons, they also argued the capabilities associated with these technologies would be decisive in future war. Though the effects of air power were impressive, they were also exaggerated. The *Gulf War Air Power Study* (GWAP) concluded that the air war revealed "no fundamental breaks with the past." Numbers of enemy vehicles destroyed in the air campaign were inflated, due, in part, to successful Iraqi deception operations (unanticipated feedback). After the air campaign, the Iraqi Army retained a large force of over 1750 tanks, 900 armored personnel carriers, and 1450 artillery pieces. Air power did, however, disrupt Iraqi command and control, constrain Iraqi logistics, dismantle the air defense system, cause significant attrition on enemy ground forces, decrease enemy morale, bolster the confidence of friendly troops, and ensured freedom of action of U.S. and coalition units with absolute air supremacy. Though these accomplishments were critical to achieving the overwhelming victory, they did not address key elements of leveraging air power with the information operations campaign. [88]

In this regard, intelligence analysts had an ill-defined relationship with operational planners during ODS. Normally, target-intelligence officers from Central Command (CENTCOM) and Air Force Component, CENTCOM (CENTAF) nominated targets to be attacked according to their own analysis, those obtained from national intelligence agencies, and their understanding of the overall campaign strategy. They went into the war expecting that these nominations would form the basis for each day's air tasking order. But in Desert Storm, operational planners in the Black Hole (a special Air Force planning group directed by U.S. Air Force Brig. Gen. Buster Glosson), relying on their own intelligence sources, made the basic target selections—especially insofar as the strategic portion of the air campaign was concerned. Inevitably, this ad hoc arrangement tended to blur and confuse the relations between theater intelligence and operations. A pervasive failure to practice bomb damage assessment regularly set the stage for its inadequacy during the war. Realistic practice would have uncovered large technical, procedural, and organizational problems.[89]

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[88] McMaster, Crack in the Foundation, 12.

[89] Thomas A. Keaney and Eliot A. Cohen, *Operation Desert Storm Air Power Survey Summary Report* (Washington, D.C.: U.S. Government Printing Office, 1993), 135-143.

The *Gulf War Air Power* study also identified two major factors that limited the effectiveness of air power: "the inherent uncertainties in the information on which action in war must inevitably be based; and the often unseen or unpredictable consequences of those actions."[90] The decapitation strategy's worst feature is not in its ineffectiveness but its seductiveness. Decapitation advocates promise to solve conflicts quickly and cheaply with few aircraft, little collateral damage, and minimal or no friendly casualties. History shows that air power can coerce but not without a great effort and ground power to back it up. Western political leaders should resist the decapitation temptation.[91] Further advocacy of the decapitation strategy is found in a National Defense University study that consulted major commanders from ODS, which supported the theory that technology would not only provide a capability but would also provide a strategy. As seen below in the systems model with delay, the argument relied on the ability to achieve a high degree of certainty in war.

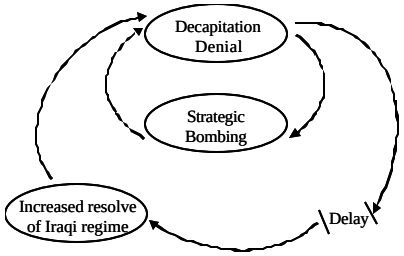

Figure 9 – ODS Systems Model with Delay

Operational Fires, Information Operations and Kosovo

OPERATION ALLIED FORCE was planned as a five-day air campaign to coerce Yugoslavian President Slobodan Milosevic to "withdraw his forces and cease hostilities" against the ethnic Albanian population in the province of Kosovo. There was a high degree of confidence at the outset of the war. Yugoslavia after the wars of the early 1990s was a weak state unable to threaten the North Atlantic Treaty Organization (NATO) bases of operations or lines of communication. American military technology had

[90] McMaster, Crack in the Foundation, 12.
[91] Pape, *Bombing to Win*, 253.

continued to improve since ODS. It was less than three years since the publication of Joint Vision 2010, but information superiority seemed within grasp. Unmanned aerial vehicles would provide greater fidelity of the battlefield in real-time. Joint STARS radar systems had an improved ability to track ground targets. Precision munitions including laser-guided bombs, cruise missiles, the new Joint Direct Attack Munition (JDAM), and Stand Off Weapon (JSOW) were available in great quantities. As the campaign began, Secretary of State Madeline Albright declared on national television, "I think this is achievable in a very short period of time." [92]

Though the United States had confidence before the outset of the war, political factors both within the United States and between the United States and its allies generated ambiguities and tensions that complicated military planning. The adversary was a sovereign nation with historical, cultural, and religious ties to Russia and much of Europe. As a result, the resolve of NATO allies was uneven despite the record of Serbian brutality in Bosnia-Herzegovina and Kosovo. Ambiguities in US policy and strained relationships between top civilian and military officials created more uncertainty and friction. President Clinton kept his policy deliberately ambiguous to forestall debate in the US Congress. The President's announcement that he had no intention of using ground forces removed an important capability and dimmed the prospect of coercing Milosevic. The administration was determined to minimize the risk of casualties even if achieving that goal placed the achievement of strategic objectives in jeopardy.[93]

When the war began, NATO objectives did not rest solely on NATO's bombing campaign. It depended also on Yugoslav reactions and initiatives that proved impossible to predict. Without the necessary force to impose NATO's will on Yugoslavia and having based initial actions on unrealistic

[92] McMaster, Crack in the Foundation, 31.
[93] Ibid., 32.

assumptions about the coercive power of air strikes, Yugoslavia seized the initiative soon after the war began.[94]

Despite the considerable preparations of war planning, the fog and friction of war made achieving information superiority difficult for NATO. Poor weather, heavy cloud cover and mountainous, forested terrain degraded satellites, UAVs, and radars. As a result of not achieving information superiority, Serbian decisions surprised NATO planners. Milosevic anticipated NATO's actions and countered them. He moved troops to the border of Kosovo weeks prior to the initiation of air and missile attacks. When the campaign started, those forces threw the Albanian population into the street, stripped them of their identification, looted their possessions, burned their houses, and drove them like cattle toward the Macedonia and Albanian borders. A few weeks after the start of Allied Force, three-fourths of the ethnic Albanian population were refugees. Eight hundred thousand more hid in the hills inside the province. What was supposed to be a five-day air campaign drug into weeks, then months. The British government estimated that Serbs murdered ten thousand ethnic Albanians during the course of OPERATION ALLIED FORCE.[95]

To NATO's chagrin, it assessed that the air campaign had unintentional consequences of actually accelerating the brutal ethnic cleansing operations it was intended to stop. Further, Milosevic appeared to endure the air campaign--discarding the assumption that he would be coerced into submission. In fact, as OPERATION ALLIED FORCE continued, General Wesley Clark, CINC NATO forces, found that interaction with the enemy created considerable friction, complicated the conduct of the air campaign, and generated uncertainty. On the air campaign's seventh day, Clark observed that NATO was facing "an intelligent and capable adversary who is trying to offset all our strategies." In short, the Serbs learned to adapt in order to counter NATO's strategies. The Serbs learned to protect their antiquated air defense systems, used innovative methods to keep their radars active and deceived and manipulated American intelligence. As a result, the Serbs forced NATO aircraft to altitudes above fifteen thousand feet which

[94] Ibid., 33.

made target identification difficult, successfully protected their radars, and used low-technology tactics and improvisations to down an F-117 Stealth Fighter. Additionally, Serb forces deceived reconnaissance aircraft by using decoys that replicated actual targets and learned the times when JSTARS conducted reconnaissance flights. As a result, approximately five hundred of the three thousand precision munitions used struck those decoys and the Serbian forces adapted to reconnaissance flights by halting their forces on the side of the road so the system would not detect "moving target indicators."[96]

During the assessment phase of the targeting process, confusion over the results of the bombing campaign became apparent. Initial reports estimated that the bombing destroyed over 450 artillery pieces, 120 tanks and self-propelled artillery vehicles, and 220 armored personnel carriers. But when the Allied Force Munitions Effectiveness Assessment Team later reported their findings, they found the following numbers of destroyed equipment: 14 tanks, 18 armored personnel carriers, and 20 artillery pieces. Though the campaign lasted eleven weeks and ended after 40,000 aircraft sorties and the threat of a ground invasion, the effectiveness of the campaign suggested that less than five percent of the Serbian combat systems had been destroyed during the campaign. Only after adapting and learning the enemy forces new tactics, NATO finally discussed options by combining the effects of OPERATION ALLIED FORCE with other elements such as increased diplomatic pressure (especially from Russia), a Kosovo Liberation Army offensive, and the threat of a NATO ground offensive helped NATO succeed and Milosevic acquiesced.[97]

Critical Analysis

Disjointed, Linear Control, or Causal-Loop, Non-Linear Feedback Viewpoint

Coinciding with the Balkan's peacekeeping experience was the emergence of IO as an element of combat power. But in 1998, a break-through occurred during the First Armored Division's (1AD) tour of duty in Bosnia. Division planners discovered that the process described in FM 6-20-10, *Tactics,*

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[95] Ibid., 33.
[96] Ibid., 33-34.

Techniques, and Procedures for the Targeting Process, could be used to integrate IO into tactical operations. First Armored Division (1AD) planned and executed several information operations by following the targeting methodology of decide, detect, deliver and assess (D3A). During operations in Kosovo, field support teams from the US Army Land Information Activity (LIWA) in conjunction with the fire support element (FSE) from the 1st Brigade, 1AD, have refined the merging of IO and targeting. Building upon the tactics, techniques and procedures (TTP) developed and used in Bosnia, 1AD expanded the targeting process to not only integrate IO, but also synchronize all of the command's non-lethal engagement assets into a single, focused operation.[98]

Task Force (TF) Falcon's targeting team planned, coordinated, integrated, and directed the task force's targeting effort. TF Falcon's targeting cycle drove the D3A functions (See Figure 10).

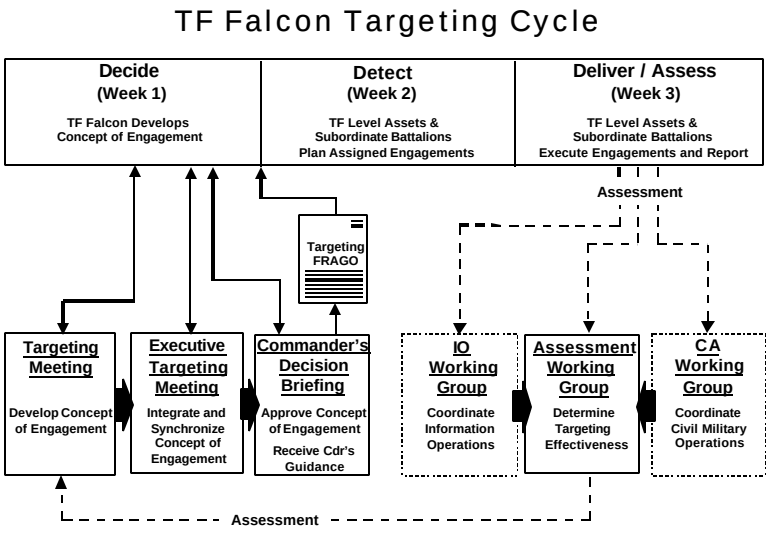

Figure 10 – TF Falcon Targeting Cycle[99]

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[97] Ibid., 34-37.

[98] CW2 Richard L. Gonzalez and MAJ (Ret) Marc J. Romanych, "Non-Lethal Targeting Revisted--The Kosovo Experience," Special Collections, Combined Arms Research Library, Ft. Leavenworth, KS, 1.

[99] Ibid., 3.

TF Falcon adopted a three-week targeting cycle divided into one-week segments. During each week, a specified D3A function was performed. Thus, the decide function was accomplished in the first week, the detect function in the second week, and the deliver and assess functions were executed concurrently during the third week. The targeting cycle was compressed or expanded in response to a change in operations tempo or the need to include lethal attack options.[100] The core targeting team consisted of the FSE targeting officer, IO analyst, and G2, G3, and G5 representatives. These members represented TF Falcon's three elements of combat power (e.g., maneuver, civil military, and information operations) and provided the link between targeting meetings and working groups and other staff functions that interfaced with the targeting process. Other staff representatives such as the PSYOP, public affairs, and medical planners assisted the targeting team as needed. The targeting team worked for the G3.[101]

In TF Falcon's targeting cycle, the FSE targeting officer headed the targeting team and was responsible for orchestrating the targeting cycle. The targeting officer also chaired the targeting meeting and produced the weekly targeting fragmentary order (FRAGO). The IO analyst developed and provided IO input to the targeting process. Because information operations are a major component of non-lethal engagements, the IO analyst lead the development of the non-lethal concept of engagement and produced the target synchronization matrix (TSM) and execution matrix for the weekly targeting FRAGO. The TSM was a tool used to establish the targeting objectives, synchronize the D3A engagements for the targeting period and translate commander's intent, concept of operation, and planning guidance into non-lethal targeting of the populace and their societal institutions. Because traditional targeting objectives (i.e., limit, disrupt, delay, divert, destroy, and damage) were not always adequate to describe the desired effects, TF Falcon used other descriptive terms such as *reduce, minimize, and increase* as non-lethal targeting objectives.[102] [See Figure 11]

[100] Ibid.
[101] Ibid., 6.
[102] Ibid., 6-8.

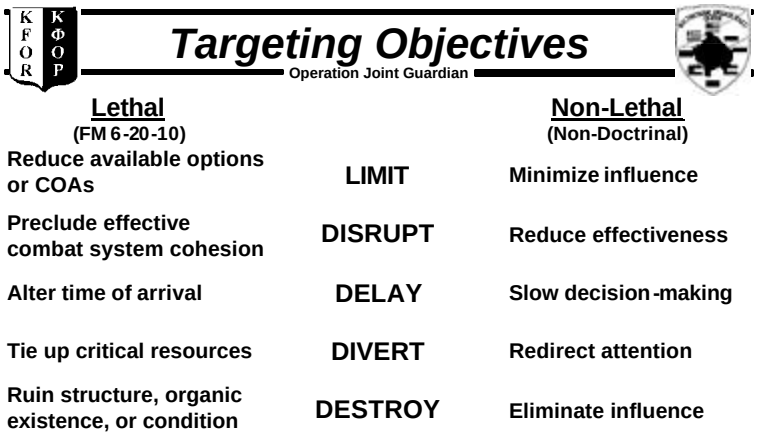

Figure 11 – TF Falcon Targeting Objectives[103]

TF Falcon also used non-standard attack, or engagement, effects for non-lethal engagements. The following non-lethal engagement effects were used for the task force's targeting effort [See Figure 12].[104]

[103] Ibid.
[104] Ibid., 9.

Lethal Effects (FM 6-20-10)	Example Non-Lethal Effects (Non-Doctrinal)
Harass	Inform -- Provide information (to counter misinformation)
	Influence -- Curtail or cause a specific action
Suppress	Warn – Provide notice of intent (to prevent a specific action)
Neutralize	Co-opt – Gain Cooperation
	Disorganize – Reduce effectiveness of ability
	Isolate – Minimize power or influence
Destroy	Deny -- Render ineffective by physically denying (e.g., confiscate equipment, detain personnel, occupy terrain)

Non-targeting effects are needed [12]

Figure 12 – TF Falcon Targeting Effects[105]

For TF Falcon, assessing the feedback of the targeting effects was a significant challenge. In order to assess the status of the targeting effort, the TF Falcon targeting team reviewed unit intelligence and operations reports for information that indicated whether the targeting effort was achieving its objectives. Two types of information were gathered. The first type was incident data (a record of key incidents that occur during a targeting period) and the second type was indicator data (significant events that provide an indication of change in the operational environment).[106] Examples of incident data include acts of ethnic violence, civil disobedience, peaceful demonstrations or refugee returns. Examples of indicator data include an attack on an important political faction leader or a series of violent demonstrations. Armed with its assessment of incident and indicator feedback, the targeting team reviewed the current targeting objectives to determine if targeting was shaping the operational environment as planned, or if changes in the environment indicated that the targeting objectives must be adjusted to reflect a new situation. To maintain the effectiveness of the targeting effort, the team also considered changes to target selection and

[105] Ibid.
[106] Ibid., 11.

engagement methodology, IO themes and messages, and collection requirements.[107] In short, the value of using the targeting methodology to plan and execute lethal and non-lethal engagements resided in TF Falcon's ability to *adapt* in order to *direct* disparate assets and means into a ***single, focused operation***.

Meeting the MFM Criteria: A Final Analysis

As with the ODS, Kosovo represented the culmination of a culture of military leadership that embraced a Clausewitzian culture after returning from the wreckage of Vietnam. Unlike McNamara with his rigid engineering view of the world, Clausewitz provided officers an intellectual statement for their deepest belief that war was inherently unpredictable, uncertain, and ambiguous at every level. Though the emerging military culture appreciated the centrality of the human factor of war, they, too, would fall prey to the McNamara paradigm—a belief that American technological superiority will allow U.S. forces to achieve quick, easy victories over their opponents with relatively few casualties.[108] So once the psychological dynamic of war was unleashed, the future course of events depended not only on NATO's bombing plan but also on Yugoslav reactions and initiatives that proved impossible to predict.[109]

The Kosovo experience revealed the dangers of linear thinking and being unprepared for the interaction that occurs with one's enemy once war begins. As a result, political and military leadership learned that extreme technological superiority does not necessarily lead to information superiority or remove uncertainty and friction, but it did bring to light that the causes of uncertainty in war mainly fall outside of technology's reach—war's political nature, its human dimension, its complexity, and interaction with the enemy.[110] Military organizations should take all possible actions to leverage technology in order to minimize uncertainty and friction, but they must also adapt to win in an uncertain environment.

Once the effects of OPERATION ALLIED FORCE were combined with other elements of national power, NATO succeeded in their objectives. In the case of TF Falcon, they saw the environment as non-

[107] Ibid., 12.
[108] Murray, "Clausewitz In, Computer Out," 6.
[109] McMaster, Crack in the Foundation, 32.

linear maneuver space defined in terms of time and events rather than geographic locations. To shape this ambiguous environment, TF Falcon employed non-lethal assets—tactical PSYOP teams, a public affairs detachment, civil affairs tactical support teams, combat camera teams, medical teams, unit commanders, and unit patrols—in conjunction with lethal assets.[111] As seen in the balancing and reinforcing mechanisms below, the key for TF Falcon in integrating non-lethal assets was a concept of fires, or engagement that focused available means on select leaders and populace groups that influenced the attitudes and behavior of the general populace.

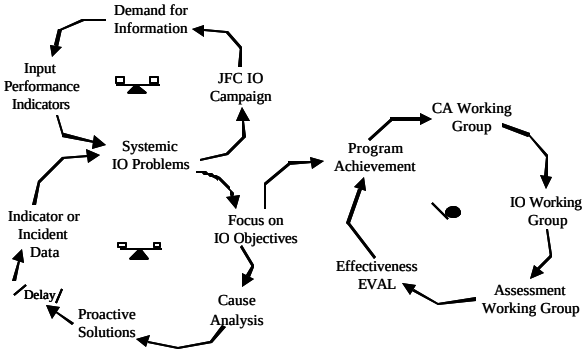

Figure 13 – Balancing-reinforcing Model

Procedurally, the development of a non-lethal concept of engagement was the same as traditional targeting methodology with the only difference being in the desired targeting effects and the targets themselves.[112]

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[110] Ibid., 36.
[111] Gonzalez and Romanych, "Non-Lethal Targeting," 2.
[112] Ibid., 3.

CHAPTER 4: STATEGIES FOR BUILDING A SHARED VISION OF INTEGRATING HARD SYSTEMS, SOFT SYSTEMS AND SYSTEM DYNAMICS

"The Army plans to disband an additional 39 artillery battalions in the active force and the National Guard. With joint fires available from the Air Force and Navy, the Army must divest itself of much of the Cold War-era heavy fires structure."—official from the House Armed Services Committee, January 28, 2004.

An effective synchronized and collaborative strategy among the services empowers organizations to achieve new operational efficiency and effectiveness while enhancing service capabilities and maximizing training opportunities. With the evolution of information warfare, methodologies and doctrine, the joint community is evolving to meet the changing needs of the military services. Now more than ever, the Army has at its disposal a number of viable alternatives for large scale and complex initiatives that involve interagency and service connectivity and integration, but the future challenge is how the Army will leverage considerable crossover and overlap between real-time data synthesis and near-time data synthesis. These new slants on information warfare have serious implications on the Army culture, on how we organize, how we train, and how we operate.

The Army will need to bring back theory-building across the profession. Theory-building here is defined as training centers that go about the business of collecting intellectual intelligence confronting the contemporary Army and serve as institutions that stimulate innovative thinking by identifying good theorists and encouraging them to think out loud through both personal communications and professional forums.[113] This will require a significant cultural shift among Army professionals to recognize the intrinsic value to the profession of those who chose to pursue intellectual abstraction as a career goal over "muddy boots." After the Philippines War, the American military entered into a period of resolute

[113] Blackwell, James A., "Professionalism and Army Doctrine: A Losing Battle?" in *The Future of the Army Profession*, ed. Don M. Snider and Gayle Watkins, 103-125, (New York: McGraw-Hill, 2002), 121.

professionalization. Serious institutions, such as the staff college at Fort Leavenworth and the Army and Navy War Colleges, were founded for the education as opposed to the training of officers. By the 1920s, the American military services were firmly established with cultures that identified their officers as professionals, possessing a body of significant knowledge that could only be gained through systematic training, experience, and education. By the early 1960s, however, that culture framework had dramatically changed. The faculties of the war and staff colleges had become repositories for officers whose careers were over. According to Williamson Murray, Horner Professor of Military Theory at the Marine Corps University, it had become the kiss of death for an officer to receive an assignment to teach on the faculty of any school. Murray states that in the U.S. Navy, it had become fashionable for officers to be selected for senior service school but not to attend; the Army War College is an institution where war rarely appears in the curriculum; the army has turned the School of Advanced Military Studies (SAMS) into a humdrum planning exercise; the Air War College has returned to the golf course; and the National War College remains buried within the army's budget, where it fails to get the support it needs.[114] While his statements may be overstated, his views may have some validity in suggesting that the Army needing to be more comfortable about investing in theory-building military professionals.

The Army must open its dialogue to outside contribution and review on its organization. It should welcome rival claims by proponents of ideas from other services, the joint community, and even from the Office of the Secretary of Defense.[115] It cannot view every new idea as a potential threat to Army plans, programs, and budgets, but should welcome the opportunity to demonstrate the superior persuasiveness of Army doctrinal concepts at the intellectual level. Discussion of the need for joint C2 approaches in an era of Information Age Warfare explicitly considers situations where the best information may no longer be located at the subordinate command engaged in the field, but rather may be located at senior headquarters. This implies a change in the best joint approach to C2. The increasing need for reach-back capability and

[114] Murray, Clausewitz In, Computer Out, 2, 7.
[115] Blackwell, Professionalism and Army Doctrine, 121.

collaborative tools is recognition of these changes. Whenever speed of decision-making becomes crucial, creation of joint automated approaches to decision-making becomes relevant.

The Army will have to train differently, using concepts like collaboration, computer-based training, video teleconferencing, and distributed learning. Traditional Army collaboration in the information domain has extended to little more than data being processed locally or at very high levels and not really shared across echelons or functional arenas. Each command center acted as a sink for data and information, soaking up all it could find and expending major effort to integrate it and come up with a rich understanding of the military situation. The lack of automated data processing capability and the limited bandwidth available within and across command centers encouraged functional specialization throughout the system.

In the joint community, the Army must discuss options that are more interoperable. When collaboration in the information domain is enriched, considerable improvements can be expected. First, the sharing of data greatly improves the likelihood of developing a common (shared) picture of the battlespace. Second, by sharing information more rapidly a similar value-generating effect occurs—more joint and coalition command centers are aware of more information sooner for a synergistic effect. Finally, Information Age systems also allow for better availability of prior knowledge. Military forces depend upon doctrine, training, and skills of their personnel. However, not all forces are fully up to speed in all areas all the time. Forces train for a set of operating environments, with an expected set of coalition partners, and specific classes of adversaries, as well as with particular types of equipment.[116] An Air Chronicles article from 2001, "Shock-Based Operations," addresses training and information age combat assessment of an enemy's system. The author, John Shanahan, concluded that the Air Force must look beyond conventional indicators and examine more closely a number of other indicators. Those indicators included economic (cash flow, major financial transactions, stock market fluctuations); military (personnel, equipment, vulnerabilities); human intelligence (third-party observers, diplomats, media

coverage); cognitive (psychological and sociological analysis of adversary leadership); electromagnetic spectrum (signals intelligence, communications intelligence); battle damage (ISR assessment of weapons systems); infrastructure (transportation system movements, telecommunications network status); and cultural or ideological (media accounts, internet intercepts).[117]

Finally, the Army will need to change the way it operates. It needs to work towards achieving realistic expectations about what IO can really do by resourcing IO working groups properly. BCTP, Team Delta recently provided information stating that most Army and Joint staffs are not sufficiently resourced or organized to plan and manage IO. There are a number of principles to IO, but the challenge is complex because vast amounts of information flow over the entire battlefield. This information must be sorted and analyzed, and without a formal, dedicated planning process that converts information to knowledge, the result will be information overload.

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[116] David S. Alberts et al., *Understanding Information Age Warfare*, Department of Defense Command and Control Research Program, August 2001, 193-195.

[117] John N.T. Shanahan, "Shock Based Operations," May 2001, database online, accessed 19 May 2003, available from http://www.airpower.maxwell.af.mil/airchronicles/cc/shanahan.html.

BIBLIOGRAPHY

Air Force Press Release No. 1217032, 17 December 2003. Washington D.C. Secretary of the Air Force, Director of Public Affairs.

Alberts, David S., John J. Gartska., Richard E. Hayes, and David A. Signori. *Understanding Information Age Warfare.* DoD Command and Control Research Program (CCRP). August 2001 (Reprint July 2002).

Baritz, Loren. *Backfire.* Baltimore, MD: The Johns Hopkins University Press, 1998.

Berkowitz, Bruce. *The New Face of War: How War Will Be Fought in the 21st Century.* New York, Free Press, July 2003.

Binnendijk, Hans. *Transforming America's Military.* Washington, D.C.: National Defense University, August 2002.

Blackwell, James A. "Professionalism and Army Doctrine: A Losing Battle?" In *The Future of the Army Profession*, ed. Don M. Snider and Gayle Watkins, 103-125. New York: McGraw-Hill, 2002.

Bolman, Lee G. and Terrence E. Deal. *Reframing Organizations: Artistry, Choice, and Leadership*. San Francisco: Jossey-Bass Publishers, 1997.

Brian J. Dunn. "Equipping the Objective Force." *Military Review*. May-June (2002), 28-33

Cheney, Richard. *Report To Congress: "Conduct of the Persian ODS"* Chapter I through VIII, Appendices A-T. Washington, D.C.: Government Printing Office, 1992.

Classics of Organization Theory, ed. Jay M. Shafritz and Steven J. Ott. Fort Worth, TX: Harcourt College Publishers, 2001.

Copeland, Thomas E. *The Information Revolution and National Security*. Carlisle, PA: Strategic Studies Institute, August 2000.

Dastrup, Boyd L. "The Come-As-You-Are War: Fort Sill and Operations Desert Shield and Desert Storm." U.S. Army Field Artillery Center and School Monograph Series. Washington, D.C: U.S. Government Printing Office, January 1997.

Donnelly, Roth and Baker. *Operation Just Cause: The Storming of Panama*. New York: Lexington Books, 1991.

Frankfort-Nachmias, Chava and David Nachmias. *Research Methods in the Social Sciences*. New York: Worth Publishers, 2000.

Friedrich, Otto. *Desert Storm: The War in the Persian Gulf*. Boston: Little, Brown, and Co., 1991.

CW2 Gonzalez, Richard L. and MAJ (Ret.) Marc J. Romanych. "Non-Lethal Targeting Revisited—The Kosovo Experience." 1 November 2000. **Unpublished paper.**

Gordon, George J. and Michael E. Milakovich. *Public Administration in America*. New York: St. Martin's Press, 1998.

Greer, James K. "Operational Art for the Objective Force," *Military Review* LXXXII, No. 5. September-October 2002; 22-28.

Hall, Wayne M. *Stray Voltage: War in the Information Age*. Annapolis, MD: United States Naval Institute, 30 April 2003.

Hanson, Victor D. *Carnage and Culture.* New York: Anchor Books, September 2002.

Headquarters Department of the Army. *FM: 3-0 Operations*. Washington, D.C. 2001.

_____. FM 3-13: Information Operations (Final Draft). 7 October 2002.

_____. FM 6-02.40: Visual Information Operations. 24 January 2002.

Headquarters, US Army Training and Doctrine Command. *TRADOC Pamphlet 525-3-92: Objective Force Unit of Employment Concept*. Washington, D.C. 2003.

_____. *TRADOC Pamphlet 525-3-90: Objective Force Operational and Organizational Plan, Maneuver Unit of Action*. Washington, D.C. 2003.

_____. TRAC–F-TR-03-007 Future Combat Systems Mission Needs Analysis Final Report. Washington, D.C. 2003.

_____. *Operational Requirements Document for the Future Combat Systems*. Washington, D.C. 2003

_____. *TRADOC Pamphlet 525-3-35 Force Projection of the Transforming Army*. Washington D.C. 2003.

_____. *TRADOC Pamphlet 525-3-9: Objective Fires and Effects*. Washington, D.C. 2003.

Heller, Charles E., and William A. Stofft. *America's First Battles, 1776-1965.* Lawrence, Kansas: University Press of Kansas, 1986.

Hitchins, Derek. "System Thinking." Online document accessed 1 December 2003. Available at http://www.hitchins.co.uk/SysThink.html 12/1/2003.

U.S. Department of Defense. Joint Publication 3-0: Doctrine for Joint Operations. 10 September 2001.

_____. Joint Publication 3-09: Doctrine for Joint Fire Support. 12 May 1998.

_____. Joint Publication 3-13: Joint Doctrine for Information Operations. 9 October 1998.

_____. Joint Publication 3-13.1: Joint Doctrine for Command and Control Warfare (C2W). 7 February 1996.

_____. Joint Publication 3-58: Joint Doctrine for Military Deception. 31 May 1996.

_____. Joint Publication 3-60: Joint Doctrine for Targeting. 17 January 2002.

_____. "Joint Vision 2010." *Joint Electronic Library.* [CD ROM] Washington, D.C., 2002.

_____. "Joint Vision 2020." Online document accessed 27 June, 2003, 8. Available from http://www.dtic.mil/jointvision.

"Initial Information Operations Observations." U.S. Army Combined Arms Center Assistant Chief of Staff/G3 (Information Operations), Ft. Leavenworth, KS.

Keaney, Thomas A. and Eliot A. Cohen. *Operation Desert Storm Air Power Survey Summary Report.* U.S. Government Printing Office, Washington, D.C., 1993.

Kennedy, Paul. *Preparing for the Twenty-First Century.* New York: Random House, 1993.

Krepinevich, Andrew F., Jr. *The Army and Vietnam*. Baltimore: The Johns Hopkins University Press, 1986.

Libicki, Martin, C. *Defending Cyberspace and Other Metaphors*. Washington, D.C.: National Defense University, February 1997.

Libicki, Martin C. *What is Information Warfare?* Washington, D.C.: National Defense University, August 1995.

Lind, Morten. "What Methods are based on Functional Modeling?" Article available online, accessed 1 December, 2003. Available from http://www.enre.umd.edu/ifmaa/fm04.htm.

MacGregor, Douglas A. "Future Battle: The Merging Levels of War." *Parameters* XXXII, No. 4. Winter 1992-93, 33-47.

McIntyre, S.G., M. Gauvin, and B. Waruszynski. "Knowledge Management in the Military Context." *Canadian Military Journal* vol/no. Spring 2003, 35-40.

McMaster, H.R. (LTC). "Crack in the Foundation: Defense Transformation and the Underlying Assumption of Dominant Knowledge in Future War." U.S. Army War College Center for Strategic Leadership Volume S03-03, November 2003.

Mintzberg, Henry. *The Rise and Fall of Strategic Planning*. New York: The Free Press, 1994.

Murray, Williamson. "Clausewitz Out, Computer In. Military Culture and Technological Hubris." *The National Interest 48.* Summer 1997, 57-64.

"Non-Lethal Targeting in Kosovo." U.S. Army Combined Arms Center Assistant Chief of Staff/G3 (Information Operations), Ft. Leavenworth, KS. 31 March 2001.

Pape, Robert A. *Bombing to Win: Air Power and Coercion in War*. Ithaca, NY: Cornell University Press, 1996.

Senge, Peter. The Fifth Discipline: The Art & Practice of The Learning Organization. New York: Doubleday, 1990.

Shafritz, Jay M. and J. Steven Ott. *Classics of Organization Theory.* New York: Harcourt College Publishers, 2001 (fifth edition).

Schelling, Thomas C. *Arms and Influence*. New Haven, CT: Yale University Press, 1966.

Shanahan, John N. T., "Shock-Base Operations." May 2001. [database on-line]; accessed 19 May, 2003; available from http://www.airpower.maxwell.af.mil/airchronicles/cc/shanahan.html.

Smith, Merritt Roe and Leo Marx. *Does Technology Drive History? The Dilemma of Technological Determinism*. Cambridge, MA: The MIT Press, 1994.

TRADOC Pamphlet 525-5. Force XXI Operations. Fort Monroe, VA.: TRADOC, 1 August 1994.

Vego, Milan N. Operational Art (Lecture). United States Naval War College, 14 March 1995.

Vego, Milan N. On Operational Art (2d Draft). United States Naval War College, March 1998.